

arrows A. External air flow is illustrated with reference to arrows B. In use, the first plurality of fans **134** may blow re-circulated air through channels **144** on a side **138b** of plenum **128** to the surface of the plurality of light sources **120** positioned between plate **124** and heat shield **116**. The circulated air may flow across a surface of the plurality of light sources **120** and absorb and transfer the heat. The heated air may be directed to flow through channels (not shown) on side **138a** of plenum **128** to the bottom portion **148** of heat exchanger **130**. Fans **132** may direct external air in the direction of arrows B, through a plurality of fins **176** (FIG. 1E) on top portion **146** of heat exchanger **130**, whereby the external air absorbs and transfers the heat from the heated re-circulated air out of the lighting module **112**. Thus, the re-circulated air may be cooled by the external air when blown through the heat exchanger **130**, before returning to the plurality of light sources **120**. Using re-circulated air to cool the plurality of light sources **120** prevents any dirt, dust or any other contaminants from contacting and building up on the plurality of light sources **120**.

[0041] In another example, the cooling medium may be re-circulated throughout the lighting module **112** using at least one conduit or fluid passageway. As the term is used herein, a conduit refers to a channel, tube, routing port, pipe, or the like that permits or communicates a fluid (a gas, liquid, or combination thereof) between two locations. The plenum **128** may be designed to house a plurality of conduits interconnected with the first plurality of fans **134** and heat exchangers **130** to re-circulate the cooling medium there-through. In another embodiment, conduits may be positioned near or on the surface of the plurality of light sources **120** between the plurality of light sources **120** and plate **124**, where the cooling medium may absorb and transfer the heat generated by the plurality of light sources **120**. As the cooling medium flows through the plenum **128** and/or conduits, it may absorb and transfer the heat generated from the plurality of light sources **120**. The cooling medium may then be flowed through the conduit to a bottom portion **148** of the heat exchangers **130a-c**. Fans **132a-c** may blow an air source, such as ambient air, into a top portion **146** of the heat sinks **130a-c** to absorb and transfer the heat from the heated cooling medium as the heated cooling medium is flowed through the conduits in the heat exchanger **130a-c**. The cooled cooling medium may then be recirculated from the heat exchangers **130a-c** to the plenum **128** to absorb additional heat generated from the lighting sources.

[0042] The cooling medium may be any gas, fluid or liquid, or any other material that is able to absorb heat, such as anti-freeze. In one embodiment, air may be used as a cooling medium in the conduit. In other embodiments, the cooling medium may be external ambient air.

[0043] FIG. 1E is a back perspective view of the separable backlighting system of FIGS. 1A-1D. The lighting module may have a back casing **142** to enclose the lighting module **112** in a housing. The lighting module **112** may have a power inverter board **170**. Power inverter board **170** may provide the necessary voltage to run the plurality of light sources **120**.

[0044] The lighting module **112** may also have a logic device **136**. Logic device **136** may be any programmable logic device, processor, video card, or the like. FIG. 1F is a block diagram of an exemplary logic device of the separable backlighting system of FIGS. 1A-1E. Although illustrated with specific components, the components are not intended to be limiting as the logic device **136** may have other compo-

nents as desired by the user. Logic device **136** may have a processor **150** having a memory **152** to store any desired data such as a desired brightness of the lighting module **112** and video data **162** to store any video data. The memory may be any type of known memory such as random access memory (RAM), non-volatile random access memory (NVRAM), or the like. The processor **150** may be coupled to a user input **154** to receive signals from a user. The user input **154** may be any type of known input such as a keyboard, touch screen, mouse, or the like. Processor **150** may control the fans **132**, **134**, light sources **120**, redundant light sources, and any other devices desired by the user. Processor **150** may also be in communication with any other devices, such as the master gaming controller, as further discussed below.

[0045] As briefly discussed above, logic device **136** may detect when one of the light sources **120** no longer emits light. In one embodiment, logic device **136** may communicate with a plurality of light sensors **164** coupled to the plurality of light sources **120**, which may include a plurality of redundant light sources. The plurality of light sensors **164** may be any known light sensors. The light sensors **164** may communicate with processor **150** to inform the processor **150** when any of the light sources **120** no longer emit light. Any other known methods may be used to determine whether the light source is emitting light or not.

[0046] Should a user desire the display to be brighter or should one of the light sources no longer emit light, logic device **136** may transmit a signal to any redundant light source to turn on and emit light. In another example, a user may want less light output from the lighting module **112**. Logic device may signal one of the light sources **120** to turn off and not emit light.

[0047] Logic device **136** may also control the speed of the fans **132**, **134**, thereby controlling the speed of the air flow through lighting module **112**. In one embodiment, lighting module **112** may have at least one temperature sensor **180** in communication with logic device **136** to detect the temperature of the lighting module **112**. When the temperature sensor **180** detects an overheating of the lighting module **112**, logic device **136** may increase the speed of the fans **132**, **134** to increase the air flow through the lighting module **112**. Additionally or alternatively, logic device **136** may turn off any or all of the plurality of light sources **120**. This prevents warping or premature failure of the optical module **100**. When the temperature sensor **180** detects a temperature within a normal operating range, logic device **136** may turn on all or any of the plurality of light sources **120** and/or reduce the speed of the fans **132**, **134**.

[0048] Lighting module **112** may have any other logic devices desired by the user such as a touchscreen controller **172**, power distribution board **174**, on screen display board, or the like. Additionally, although illustrated positioned in specific locations, the locations are not intended to be limiting as the devices may be coupled to the lighting module **112** in any configuration.

[0049] Although the lighting module **112** is illustrated as a back lighting module coupled to the back of the optical module **100**, the location of the lighting module is not intended to be limiting, as the module may be located on the sides, top, or any other location or configuration desired by the user.

[0050] FIGS. 2A and 2B illustrate right and left side views of the separable backlighting system of FIGS. 1A-1C, respectively. Optical module **100** may be a separate enclosed structure having a touch screen **16**, first display device **102**, optical